

## Chapter 12 • Surface Areas and Volumes

# Part 11 · The Escape Challenge

Five gates, each a calculation. Each gives you one digit. Collect all five to unlock the exit code.

## □ GATE 1 — The Hemisphere Gate

Find the CSA of a hemisphere of radius 7 cm, using  $\pi = \frac{22}{7}$ . Take the first two digits of your answer.

**Digit:**

## □ GATE 2 — The Slant Gate

A cone has radius 3 cm and height 4 cm. Find its slant height.

**Digit:**

## □ GATE 3 — The Cube Gate

A cube has edge 5 cm. Find its total surface area, then take the first digit.

**Digit:**

## □ GATE 4 — The Toy Gate

In the classic Example 7 toy (hemisphere + cone, radius 2 cm, cone height 2 cm,  $\pi = 3.14$ ), the volume of the toy and the "leftover" volume in its circumscribing cylinder turn out equal. Take the ones digit of that common volume, rounded to the nearest whole number (25.12 rounds to 25).

**Digit:**

## □ GATE 5 — The Combination Gate

How many different pairs of basic solids are named in the Learn First notes as classic combinations (cone+hemisphere, cube+hemisphere, cylinder+cone, cylinder+hemisphere)? Count them.

**Digit:**

**EXIT CODE:**

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*From a playing top to a bird-bath, every combined solid this chapter throws at you reduces to the same two golden rules: surface areas only count what is still exposed, volumes simply add. Get those two sentences right and the arithmetic takes care of itself. □□*